
**CLINICAL BOTTOM LINE**

**Sequential Oral Sensory (SOS) Feeding Approach**

Feeding difficulties affect an increasing number of children with disabilities and their families. Practitioners widely use the SOS feeding approach to address these feeding concerns among a broad range of children. A limited amount of evidence is available to support its effectiveness, however.

The approach uses a hierarchical, step-by-step process for encouraging the consumption of a wider variety and larger volume of foods. A score of the child’s level of interaction with the food is given, on the basis of a 25-step scale developed by Toomey (2007). This study examined the effectiveness of the SOS feeding approach by exploring the trends based on the 25-step scale. Occupational therapists and speech–language pathologists carried out the intervention over 1, 2, or 3 school years. The participants included children with autism spectrum disorder (ASD), cerebral palsy (CP), neurological impairment, or unspecified diagnosis. After a retrospective analysis of the data, the authors found mixed results for increasing feeding scores over time.

**Implications for Occupational Therapy**

The SOS program is commonly used by occupational therapists to address feeding challenges among children with selective eating behaviors and sensory-processing difficulties. Limited evidence was found to support the effectiveness of the SOS approach for children with disabilities. The results do, however, show a positive trend for the majority of participants with neurological impairment, as well as being more effective for boys than for girls.

Fewer than half of the children with ASD had a positive trend in scores, and they showed
inconsistencies in day-to-day feeding scores, which aligned with the child’s typical behavioral presentations. The children with the strongest drinking skills showed a more positive trend, which indicates that developmental readiness may affect the uptake of feeding intervention.

The SOS program is often implemented with children over an extended period of time. Occupational therapists should consider the effectiveness of the SOS intervention and characteristics of each child, especially those with ASD or CP, before intervening. Further research is needed to determine the effectiveness of the SOS feeding approach for a wider variety of children and environments. In addition, future research should include a comparison or control group.

RESEARCH OBJECTIVE(S)
Evaluate the outcomes of the SOS approach for children with feeding difficulties

DESIGN TYPE AND LEVEL OF EVIDENCE
Level IV: Retrospective, repeated-measures within-subject
The authors used inferential statistics to analyze descriptive variables for children and feeding scores across cases, however.

PARTICIPANT SELECTION
How were participants recruited and selected to participate?
Retrospective review of records from participants who were receiving services through the Easter Seal Society of Western Pennsylvania at four community-based locations

Inclusion criteria:
Records from 2007 to 2010 of children who participated in the SOS feeding program were reviewed. Children were between 30 and 92 months old; had a diagnosis of ASD, CP, neurological impairment, or unspecified; and were a part of the Easter Seal Society of Western Pennsylvania program.

Exclusion criteria:
Participants were excluded if documentation “did not reliably transfer to the 25-step SOS progression of feeding” (p. 292).

PARTICIPANT CHARACTERISTICS
N= 34
#/ % Male: 19/56%  #/ % Female: 15/44%
**Ethnicity:** | Not reported  
---|---
**Disease/disability diagnosis:** | ASD, CP, neurological impairment, and unspecified  
---|---

## INTERVENTION AND CONTROL GROUPS

**Group 1: SOS intervention group**

| Brief description of the intervention | The SOS approach to feeding is based on a hierarchy that includes tolerance, interaction, smelling, touching, tasting, and eating foods. The program progresses through the steps, with the ultimate goal of continuation of trying new foods and eating sufficient calories.  
---|---
| How many participants in the group? | 34  
---|---
| Where did the intervention take place? | Four community-based locations  
---|---
| Who delivered? | Occupational therapist and speech–language pathologists  
---|---
| How often? | Two times per week  
---|---
| For how long? | Nineteen children participated for 1 school year, 13 participated for 2 school years, and 2 participated for 3 school years.  
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## INTERVENTION BIASES

**Contamination:**

| YES ☐ | NO ☒ | No control group in this study  
---|---|---

**Co-intervention:**

| YES ☒ | NO ☐ | The authors did not report whether participants were receiving additional interventions that could have also affected the targeted outcomes.  
---|---|---

**Timing of intervention:**

| YES ☒ | NO ☐ | The interventions occurred over 1 or multiple school years. Maturation, development, and experience could have been a factor in the results of this study.  
---|---|---

**Site of intervention:**

| YES ☒ | NO ☐ | The intervention was carried out at multiple locations.  
---|---|---
Use of different therapists to provide intervention:

| YES ☒ | NO ☐ | Multiple therapists carried out the intervention. Therapists were required to complete an SOS basic training course, however. |

Baseline equality:

| YES ☐ | NO ☒ | No control group in this study. |

MEASURES AND OUTCOMES

**Measure 1: 25-step scale**

<table>
<thead>
<tr>
<th>Name/type of measure used:</th>
<th>25-step scale part of the SOS approach developed by Toomey (2007), measuring interaction with food</th>
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<tbody>
<tr>
<td>What outcome is measured?</td>
<td>Level of interaction child had with food, from Level 1 (child tolerates food in the room) up to Level 25 (child bites, chews, and swallows all food or drink)</td>
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<tr>
<td>Is the measure reliable (as reported in the article)?</td>
<td>YES ☐ NO ☐ Not Reported ☒</td>
</tr>
<tr>
<td>Is the measure valid (as reported in the article)?</td>
<td>YES ☐ NO ☐ Not Reported ☒</td>
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<tr>
<td>When is the measure used?</td>
<td>After each session for every food item</td>
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MEASUREMENT BIASES

**Were the evaluators blind to treatment status?**

| YES ☐ NO ☒ | Evaluators reviewed charts that were all part of the SOS intervention group. |

**Was there recall or memory bias?**

| YES ☐ NO ☒ | Retrospective analysis was conducted, but results were scored by the therapist conducting the intervention. |

**Other measurement biases:** *(List and explain)*

RESULTS

List key findings based on study objectives:
The objective of this study was to determine whether the SOS feeding program was effective or showed a positive trend in feeding scores for children with varying disabilities. The main findings of this study were mixed. Sixteen participants showed no positive trend in food scores, and 18 participants had some positive trend. Only 6 participants had a positive trend for all food types. Nearly 70% of children with neurological impairment had a positive trend, whereas only 39% of children with ASD showed a positive trend. The intervention showed a significant difference between male and female participants, with boys accounting for the majority of the highest positive trends. Finally, the children who improved in all food types did so at the same point and generally had little difficulty with handling liquids, which indicates a developmental readiness for the intervention.

Was this study adequately powered (large enough to show a difference)?

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<thead>
<tr>
<th>YES ☒</th>
<th>NO ☐</th>
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<tr>
<td>This study had a relatively small sample size but was adequate for the analysis completed. The study was not equally representative of all diagnoses: Children with CP represented only 12% of the sample, and children with no specified diagnosis also represented 12% of the sample.</td>
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Were the analysis methods appropriate?

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<tr>
<th>YES ☒</th>
<th>NO ☐</th>
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<tr>
<td>The analysis methods in this study were appropriate to determine whether there was a positive trend in feeding scores on the basis of each individual’s scores.</td>
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Were statistics appropriately reported (in written or table format)?

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<th>YES ☒</th>
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<td>Results were clearly reported in the narrative and tables. Trends in feeding scores for each individual were placed on a graph that included food type, session, and year of participation. Comparison of age was reported with ( t ) test, and diagnosis and gender were compared with a chi-square test.</td>
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Was participant dropout less than 20% in total sample and balanced between groups?

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<th>YES ☒</th>
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<td>The study was a retrospective design and only excluded 5 participants because the records could not be reliably transferred to a 25-step feeding score. There was a loss of data from Year 2 to Year 3 of the intervention because of institutional challenges, and it was unclear whether dropout would have been more than 20%.</td>
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What are the overall study limitations?

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<th>YES ☒</th>
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<tr>
<td>The researchers in this study used a retrospective chart-analysis design. The design did not allow for the manipulation of variables and did not guarantee the consistency or allow for control of the procedures, which caused loss of data in Year 3. The population size was limited to a small sample size of children in one program in western Pennsylvania. There is limited information about the population of participants in the study, such as socioeconomic status and ethnicity.</td>
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Another limitation of this study is that the researchers did not follow SOS protocol for length of time of intervention, and the fidelity of the interventionists was not reported. The intervention took place over varied amounts of time in different facilities, which might have had an effect on the feeding scores. Because of limited evidence regarding the SOS approach, a rigorous prospective study using the exact SOS intervention protocol should also be conducted. In addition, the study did not mention whether parents were involved in the treatment and whether any of the techniques were used in the home, which could have affected the results of this study.

CONCLUSIONS

State the authors’ conclusions related to the research objectives.

The authors of this study concluded that the SOS program, adapted to a child’s needs, was suitable and showed improvements for children with neurological impairment and feeding difficulties. There was limited evidence, however, to support the use of the SOS program for children with ASD or overall selective eating behaviors. The program was more effective for boys than girls and for children with stronger drinking skills.

Reference: